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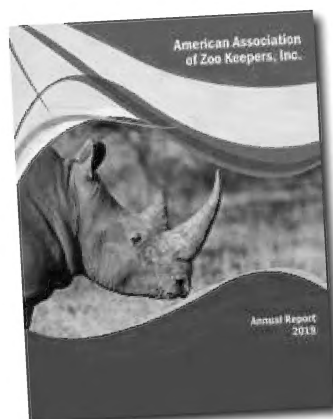
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## ABOUT THE COVER

This month's cover comes to us from Mariel Lally of Smithsonian's National Zoo and features a red panda (*Ailurus fulgens*). Red pandas, like giant pandas, are bamboo eaters native to Asia's high forests. Despite these similarities and their shared name, the two species are not closely related. Red pandas are much smaller than giant pandas and are the only living member of their taxonomic family. Red pandas share the giant panda's pseudo-thumb, a modified wrist bone used to grasp bamboo when feeding.

Red pandas are endangered and are legally protected in India, Bhutan, China, Nepal and Myanmar. Their primary threats are habitat loss and degradation, human interference and poaching. Researchers believe that the total population of red pandas has declined by 40 percent over the past two decades. It is probable that this decline will continue in the coming years. Red pandas are present in some protected areas throughout their range, including parks in Myanmar, Bhutan, India, Nepal and China. Despite regulations, livestock grazing, hunting and logging still occur.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is [shane.good@aazk.org](mailto:shane.good@aazk.org). If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: [aazk.org/akf-submission-guidelines/](http://aazk.org/akf-submission-guidelines/).

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*...this change has led to struggles, adaptations, and innovations in all facets of our lives as people and professionals.*

"The new normal..." This is phrase that has been thrown about a lot the past several months. Very little has been established in regard to exactly what this new normal will look like, but the impacts of recent events will be felt for decades to come. Zoos and aquariums have not been immune from the changes and as many facilities continue to adjust as they strive to reopen and recover, the quick uptake of new and diverse response strategies can serve to improve the profession in "the new normal."

The COVID-19 pandemic has been the most impactful event for many professionals. Almost all have seen some combination of layoffs, hour limits, pay cuts, and closures. But for the animal care professionals who have remained in place during the pandemic, a series of changes have been integrated in the face of difficulties. The months-long closures of many facilities has led to increased focus on animal observations and management leading to improved welfare, training, enrichment, and relationships in many cases. Improved communication structures have grown from splitting teams. And public engagement has made significant strides with virtual connections in an environment in which guests cannot visit the animals in-person. None of these advances are likely to offset the stress and difficulties of COVID-19, but necessity is the mother of invention in "the new normal."

The pandemic has not been the only major event as the racial equality movement has amplified during this same timeframe. The lack of diversity in the animal care field has been put under the microscope and many organizations have made commitments to improvement. These labors will take years to show results, but making strides in diversity representation, inclusion, and advancement now can lead to a greater reach for the messaging and connections forged by zoos and aquariums. One can only hope that diversity presence in the field becomes part of "the new normal"

Animal care professionals have confronted a crisis of health, security, and awareness in the face of rapid change. And this change has led to struggles, adaptations, and innovations in all facets of our lives as people and professionals. This letter began with a commonplace saying in "the new normal." I hope that, just like so much else in our personal and professional lives, this saying sees change in turn as we focus less on "the new normal" and strive to build "A Better Tomorrow."

Cheers,

Paul

#### CORRECTION

We apologize for the error. The 2020 July AKF cover photo of the two Somali wild ass was taken by Caitlin Mack, a graduate student at Michigan State University.

# AAZK Chapters 2020: A Continuing Force in Global Conservation

Ed Hansen  
AAZK CEO/CFO

*The following information was compiled from the AAZK Chapter Re-charter materials submitted in 2020 and details the conservation spending by AAZK Chapters in 2019.*

On January 1, 2020 AAZK had **116 duly chartered Chapters** within the Association, with Chapter membership totaling **1827** individuals who are members of AAZK National, with another **602** non-AAZK members who participate in Chapter social and fundraising activities. **One hundred and one** of those AAZK Chapters made contributions to fellow non-profit conservation organizations or registered charities during 2019.

In 2019, AAZK Chapters contributed **\$841,000.46** to deserving groups and charities around the globe. The average donation to conservation and charity totaled **\$8,326.74** per donating AAZK Chapter. AAZK Chapters made **548** individual donations to **362** different non-profit or charity organizations around the world, including 17 of our **AAZK Conservation Partners**.

The primary beneficiary of the generous contributions to conservation from AAZK Chapters are our internal conservation projects, Bowling for Rhinos and Trees for You and Me. AAZK Chapters raised and donated **\$475,093.80** for species and habitat conservation in the US, Asia and Africa and funded two grants in conservation, the BFR Conservation Resource Grant (**\$8,793.36**) and the Trees for You and Me Restoration Grant (**\$14,562.69**). In addition to these two grants funded by Chapter contributions, AAZK member dollars endows Continuing Education, Conservation and Research Grants with a combined total just under **\$30,000** annually for members and non-members in 2019.

After supporting AAZK Conservation programs. AAZK Chapters donated **\$365,906.66** to **270** conservation projects, emergency relief, or other charitable ventures, with the highest donor total supporting the AAZK Conservation Partner **Turtle Survival Alliance** for the second year in a row. Also included are **27 AAZK Chapters** which donated directly **back** to their **Host Facilities** to support purchase of enrichment items, projects, scholarships or research within their own facility.

I am often asked, What is the purpose of AAZK and what does a membership mean to me? Or from a facility Director who asks, Why should I support my local Chapter? The Mission of AAZK and our Chapters is straightforward:

*The American Association of Zoo Keepers exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.*

Thank you once again to all of the AAZK Chapters and members who work so very hard, day in and day out, to reinforce the Mission and Vision of AAZK and who continue to be a force in global conservation.

## 116

AAZK Chapters



## 1827

Members

## \$841K

Contributed  
globally



## 362

Number of charities  
that received  
donations from AAZK



# Being Flexible When Normal Has Changed

*Lisa Haggadone CPBT-KA, Senior Trainer  
Natural Encounters, Inc.  
Winter Haven, FL*

The years 2019 - 2020 certainly brought a big change to the world: COVID-19, a global pandemic that changed everything about our day-to-day lifestyles. Social distancing, stay at home orders, and, unfortunately, lots of furloughed and lost jobs happened in just a few short weeks. For those at home full-time, there had to be adjustments to budgets, how to find happiness and ways to stress less when it seems that nothing is how it has been. Working from home also brought challenges for those trying to achieve a work-life balance and the best ways to accomplish their tasks without burnout.

There were additional challenges for those working from home with children.

For those still going into work, flexibility can bring a difference to the day-to-day outlook, from staffing reductions and avoiding too much contact with other people, to wearing masks and washing our hands more often. The fog of the future seems like life as we knew it won't return. Social distancing has become the new normal - which can be hard for folks who really thrive on social interaction. Thanks to different platforms to video chat with others, some semblance of social gathering

was able to take place. We also learned that when hard times like these arise, if you really become flexible and think outside of the box, some really unique opportunities can present themselves.

For my husband and I, juggling our schedules for work also had to include arrangements for our one-year-old son. Our day care closed, which left us with few good options as to how and when each of us would work and who would watch him. Thankfully, my schedule moved to working four days on, then eight days off. Even if my four days of work fell during the normal Monday-Friday, my husband had the next eight days to get his work done, either from home or at the office. Working together and staying positive during this time revealed a silver lining: we both spent significantly more time with our son. As one-year-olds change and learn new things constantly, we've been able to experience, first hand, amazing milestones like his first steps.

At Natural Encounters Inc., our working world is centered at our main Ranch location where we raise, train, and house hundreds of birds. We also perform shows through contracts at events and locations around the country. When the pandemic restrictions started to affect Florida, we had to shut down those shows and adjust schedules. Less people were scheduled to work at each show caring for the birds, utilizing separate teams. When the restrictions in Florida were accelerated, all birds

*Multiple macaws flying. Photo by Steve Martin.*





and people had to move to our Ranch facility. This was no small undertaking. In a matter of days, the team at the Ranch prepped dozens of enclosures and moved the current birds around to allow for new residents. In a matter of three days, over 200 birds moved from our show locations back to the Ranch. Just caring for each bird is no small feat, let alone sorting out how to keep the entire staff as safe as possible with as much distance as we could keep. Our solution: three care teams were established to ensure if anyone got sick, we had two teams to take over during any needed quarantine. This also allowed for smaller employee numbers per shift to reduce chances of spreading the virus. One overarching task to ensure we operated at peak efficiency was to make sure communication was open, honest, and easy to access across the teams and the people who were working from home. WhatsApp groups were formed to pass along information within each section, to share information about maintenance needs, and to post anything that needed to get to the entire company. We utilized Zoom meetings each morning and afternoon to ensure those at home could stay in the loop and provide insights during discussions or problem solving.

NEI has always fostered an environment encouraging all employees to assume good intentions from other employees, to practice open and positive feedback loops, and to find ways to stay positive in all situations. Constant changes in our day-to-day work during the pandemic has certainly challenged everyone to revisit those precepts that our company deems essential. NEI has always urged open communication between management and team members. This crisis period only strengthened NEI's commitment to ensure every team member had a touch point. We continued to hold mentor meetings, as well as one-on-one meetings with supervisors or upper management. Everyone knew they had someone to turn to in the work space, discuss workplace concerns or general life frustrations. Upper management also instituted weekly "town hall" meetings to share new information. Fostering a positive environment at work was a great first step, but it was taken a step further, fostering wellness initiatives at home as well. Mental Health Awareness Month aptly fell during this time of

"safer at home" regimens. Staff members started weekly check-ins detailing activities encouraging wellness for staff to implement at home. Among the suggestions were: maintaining a healthy diet, meditation, and the importance of good sleep; all great habits to encourage a healthy lifestyle.

During this time of uncertainty, the collective minds at NEI started thinking about ways to help spread positivity and information in a new format. Webinars aren't new to the business world, but it wasn't something that NEI had tackled before. Sharing information for the betterment of animal welfare has always been important to NEI's culture. Previously, this was done through in-person consultations at zoos and aquariums as well as week-long workshops at the Ranch. With new travel and group size restrictions, we got creative in ways to share that same information. The Natural Encounters Inc. Training and Education Center (NEI TEC) was established just before the shutdowns began. Once in-person courses were put on hold, we moved to the online platform. Using NEI staff and experts who had previously helped with consultations and workshops, we launched webinars on different training and behavior-related topics. It was amazing and affirming to see the support and interest these learning opportunities generated. As the team continued on this path, new topics and themed weeks were organized. The new webinar course platform continues to evolve and it has evolved into a platform we hope to continue as the world moves to its new normal. As our technical muscles were flexed, we also began a podcast that was moderated by our COO and Show Manager. They take on different topics each week to discuss training, behavior, or any questions that are submitted by listeners.

One of our long-standing internal educational traditions also morphed. Lunch and Learn meetings were typically taught by different staff members during the lunch break at each location. We would discuss a topic, usually related to the science of behavior change, during our after-lunch meeting. We began holding these meetings daily on Zoom so the entire company could participate. One employee suggested finding a way to



Photo by Lisa Haggadone.

discuss welfare and husbandry-related topics which would enable everyone to continue to give the birds the best life possible. This suggestion led to employee-only webinars. Employees volunteer to present on topics such as beak or feather condition, listing things to worry about or look out for. Each webinar provides the ability to further each employee's knowledge and personal growth. Lastly, during this time of schedule disruption, NEI encouraged us to find ways to continue professional and personal growth. Anything deemed valuable by any staff member was passed along to the rest of the staff so that everyone could take time at home to keep learning and growing.

This pandemic certainly brought about changes to everyone's lives and caused our company and employees to evaluate, evolve, and adapt, just as the zoo world has always done. As we learn new ways to do things, we can provide the animals in our care, as well as ourselves, with better lives. Staying flexible and positive in times where new challenges are presented to us each day is important. All of us must remember that you may not be able to control what the world throws at you, but you can control how you deal with it. How you approach changes and your ability to remain positive despite the changes will help you and others get through tough times. Just remember to stay positive and get creative. We can help each other get through it! 🐾

# Bears: Gauging the Impact of Community Awareness and Education Programming

*Brande Overbey*

*PhD Fellow at Purdue University*

*Forestry and Natural Resources Department*

## Introduction

What would you do if you encountered a bear in your own backyard? Your response is likely quite different depending upon where you live. If you grew up in a “bear country” location (where bears are native), this type of encounter may be common. If you live in a state where bears are not native, this scenario may sound terrifying to you! Visitors to zoos and conservation parks are much the same; though they may marvel at the resident bears, would they be equipped to successfully

navigate an encounter with such animals in their native habitat? And how can you, as a conservation and community educator, help them to feel more comfortable avoiding conflict if they do experience such an encounter?

Across the United States and Canada, residents of bear-populated states and provinces are provided opportunities for education, outreach, and information, often known as “Bear Aware” initiatives. These community education programs are a first step toward teaching citizens

how to live safely in close proximity to such large predators. However, while bear country states and provinces may have access to programs like these, other locations where bears are not currently native typically do not. While this may seem logical, bear populations--and especially individual animals--continually move and adapt as ecosystems change and human encroachment increases. This means that areas where bears have not roamed for hundreds of years are now beginning to report occasional sightings and encounters, such as DNR reports of bears roaming into Illinois, where they are not native, from both neighboring states of Wisconsin and Missouri, where they are (McFarland, 2007). The reestablishment of North America's largest land animal to communities unaware of how to deal with such an encounter becomes a formula for fear, misunderstanding, and even tragedy. While informational programming and exhibits about conservation needs are provided at zoos, human-wildlife safety is another crucial component of the educational process that such organizations can also provide their communities.

During June of 2015, a study was conducted on residents of Illinois, USA, (where bears are not native), and on residents of traditional bear country states and Canadian provinces. Illinois was chosen as the non-native survey state because neighboring states to the north and west, Wisconsin and Missouri, do have native black bears and there





Figure 1. Illinois Respondent Map. Created by self-reported location data (data reported from locations in Indiana were included, due to the extreme proximity to Illinois).



Figure 2. Bear Country Respondent Map. Created by self-reported location data (data reported from locations not in bear country was removed from analysis).

is a potential for roaming animals to cross the border into Illinois. The goal of this study was to bring to light the public's perception of bears in their communities and Illinois residents' current lack of knowledge about how to live safely with large predators in their midst. Specifically, this study sought to demonstrate the need for community education and awareness programs for citizens in states experiencing intermittent bear encounters, such as Illinois. This is the first step to successfully managing encounters of such large predators in these areas, for the safety of both humans and bears. One of the most effective methods to combating fear is to use education to foster increased understanding and even empathy, which is what these programs typically seek to do (Wilmers, Darimont, and Hebblewhite, 2012).

To gather data, two separate research surveys were distributed predominantly via social media: one for Illinois residents and one for bear country residents. A total of **453** usable individual responses were received, 311 from Illinois residents and 142 from bear country residents (see Figures 1 & 2). The surveys were designed to measure the respondent's current knowledge of bears, fear of

encounters (for self and for others, including children, pets, and livestock), and exposure to available educational programs. Bear country respondents were also asked whether they had attended a community program. It was predicted that self-reported fear of bear contact would be higher in the residents of Illinois than in the residents of bear country states and provinces, possibly due to the availability of education programs in bear country locations.

#### Survey Results

Bear country respondents indicated that they were 'Very Knowledgeable' about bears **54.93%** of the time, in comparison to Illinois residents' **1.29%**. In regards to fear, bear country respondents selected 'Very Fearful' only **4.93%** of the time for themselves, and **9.15%** for others (including children, pets, livestock). Illinois residents on the other hand reported 'Very Fearful' **23.79%** of the time for themselves, and **33.76%** of the time for others. It was also noted that **82.39%** of respondents in bear country attended community bear education programs. In comparison, only **2.9%** of Illinois residents rated themselves as 'Very Aware' or 'Aware' of the existence of such programs. It is important to note, however, that

**60.13%** of Illinois residents reported that they were 'Not at all aware [of such programs], but interested in learning more.' Also demonstrated by the survey was decreased support for lethal management techniques (i.e. hunting, or biological control by local and state agencies) in bear country residents, with **72.56%** of respondents selecting 'Do not at all support,' in comparison to only **46.95%** of Illinois residents.

#### Discussion

This project presented an excellent opportunity to measure how fear of large predators can be affected by community education and management programs. The results indicate that community safety programs and educational literature may have a substantial impact on reducing both fear of bears and support of lethal control methods for bear populations. This provides encouragement for the importance of developing such programs in order to help create bear-safe communities and a more tolerant, empathetic populace.

The initial step to taking action on this important conservation and safety initiative is to build resources for community education. Increasing awareness and adapting the behavior of

the citizens is a fundamental component for the coexistence of humans and bears. It is crucial to not only teach citizens how to be safe around these predators, but also to teach them why the animals are an important part of a healthy world. Instructing citizens about the vital role that large predators play in a healthy ecosystem is an essential part of the success of such a program (Wilmers, Darimont, and Hebblewhite, 2012). Managing bear attractants and teaching people how to safely live near bears (non-lethal bear management) are other key components to the community educational process. Without this knowledge in the population, bears can easily become habituated or food-conditioned, which greatly increases the likelihood that the bears will need to be killed (Frank, Johansson, and Flykt, 2014). While it may be second nature for zoos to develop programming about conservation initiatives, a very tangible way to ensure the safety and survival of individual animals is to make the communities in which they live more aware of proper precautions and safety in the event of encounters. In a 2014 study on fear of brown bears and wolves, researchers found a direct correlation between self-reported fear of attack and acceptance of management

actions such as dissemination of educational programming (Frank, Johansson, and Flykt, 2014). Thus, it can be interpreted that, in communities where fear of predator species is particularly high due to lack of safety education, the implementation of such programming would be especially impactful.

Any educational program that is developed for the community should also be formatted around a few key outcomes. Such programs should serve to help the public develop a greater understanding of these predators, increase support of “bear-proofing” in the community, promote safety strategies for humans entering locations where bear contact may occur, train people about what to do if contact does occur, and most importantly encourage tolerance of these animals. When formulating actual content for such programs, it is important to keep in mind recent research findings on creating tolerance for large carnivores in the population. While factors such as control over risk (e.g. bear-safe behaviors) and increasing emotional reaction to a species are important in reducing fear, Bruskotter and Wilson (2014) found that these are

only secondary factors to consider in increasing tolerance. The most important component to a successful tolerance-building educational program is to communicate the benefits of a species to its ecosystem and to the human population, which many zoos are already working hard to do. Reducing fear-based reactions in the public may increase the safety of individuals and the animal in encounter situations, but building tolerance of the species will aid most in the actual preservation of the species overall (Slagle et al., 2013). Educating the public about the benefits that the species provides to a healthy ecosystem will increase the public’s support for preservation and protection of the species, so it is a key concept to consider for inclusion in development of such programs.

## Conclusion

To truly keep communities safe and reduce the number of bears killed due to human-animal conflict, it is vital that we all work together. Fear due to lack of understanding of the species is directly correlated to the public’s support of lethal management techniques (Frank, Johansson, and Flykt, 2014). It is also imperative to understand the important role that not only science but also socioeconomic factors and even politics play in such a conservation initiative (Kellert, 1994). Conservationists and animal behaviorists contribute to the growing body of knowledge on how best to manage these animals, while community officials can also aid in providing education and support to residents. Local proponents of community safety and animal care workers such as zookeepers can help to get the message out and boost the public’s (and subsequently, the politicians’) enthusiasm for such educational opportunities. The citizens themselves can participate in the programs or read the literature and make adequate preparation for such contact, sharing their newfound knowledge with others.

As populations grow and humans and bears continue to encroach upon one another, contacts will only increase in number in previously bear-free states and elsewhere. It is our shared responsibility to do what we can to

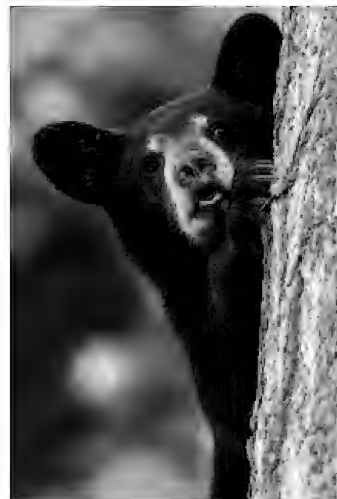


prepare our communities for this eventuality and to teach the public how to embrace this preparation. Bear-safe communities did not become this way easily. In almost all cases, it is the dedication and diligent effort of local residents, officials, and conservationists and zoo staff who transform their “unsafe, bear-killing communities into examples of increasing co-existence” (Dolson, 2015). Regardless whether the individual is bear or human, even a single life lost due to lack of preparation is one life too many. But we, as conservationists, can directly save lives every day by providing our communities with education and outreach opportunities aimed at teaching peaceful coexistence. 🐻

Bear photos by Brande Overbey

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# The Effects of Weather Simulation on Foraging Behavior of 1.1 Zoo-Housed Southern Tamandua (*Tamandua tetradactyla*)

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Ashton Ball, Small Mammal House Keeper

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## Abstract

The southern tamanduas (*Tamandua tetradactyla*) at Smithsonian's National Zoo Small Mammal House inhabit an indoor exhibit without access to the varying weather conditions they would experience outdoors. This study examined a pair of tamanduas' response to weather simulations in regards to their foraging behavior. By simulating thunderstorms in part of the exhibit and providing multiple foraging locations, the tamanduas' response was recorded and analyzed for changes in their behavior due to the weather. The simulations took place in the morning, when the tamanduas were observed to be most inactive. The objective was to use the weather simulation to stimulate natural behaviors, therefore causing the tamanduas to be more visible and engaging for the public at a time of day they previously were sedentary.

**Key Words** foraging behavior, Smithsonian's National Zoo, southern tamandua, *Tamandua tetradactyla*, weather simulation.

Minimal information on tamandua interactions with weather is known. There is little in-depth research regarding tamandua foraging behavior, and none in relation to the weather. These include studies on both wild and captive animals. The southern tamanduas in the Small Mammal House were initially most active in the afternoons. This study implemented weather simulations during their less active hours in the morning to gauge whether they became more active as a response and if they were more likely to forage during rainfall. The results from this study add to the current amount of knowledge on zoo-housed tamanduas and may give insight into how the species would behave in the wild.

## Objectives

The objective of this study was to determine if weather simulations would stimulate natural behaviors in zoo-housed tamanduas, "Manny" and "Cayenne," and cause them to be more visible and engaging for the public at a time of day they previously were not. Manny was born on 23 March 2005 and was age 13 during this study. Cayenne was born on 7 March 2014 and was age 4 during this study. Southern tamanduas

are found throughout much of South America and would experience a variety of weather patterns in the wild. This study analyzed how zoo-housed tamanduas responded to rain, thunder and lightning, and full thunderstorm simulations. The study aimed to answer three main questions. Will weather simulations in the morning cause the tamanduas to be active during a time they are normally sedentary? Are tamanduas more likely to venture into the rain to forage wet soils? How do tamandua behaviors change with precipitation, thunder and lightning, and full thunderstorm simulations?

## Study Area

This study took place in the Small Mammal House at Smithsonian's National Zoo in Washington, DC. The southern tamanduas inhabit Exhibit 31. For this study, I designated the left side of the exhibit to be zone 1 (figure 1) and the right side of the exhibit to be zone 2 (figure 2). The two zones were split by the large tree based in the center of the exhibit. Zone 1 was where the weather simulations took place, while zone 2 remained constant - the "safe zone."

## Methods

Prior to the study beginning, all aspects of the proposal were reviewed by the Small Mammal House staff to ensure the safety and welfare of the animals. We created a safe zone for the tamanduas, which remained dry at all times and included heat lamps for warmth. The ceiling lights in this zone were also left unchanged. After review, the keepers prepared the exhibit for the weather simulations. This included covering the skylight over zone 1 with a sheet to minimize the amount of natural light available through skylights and simulate cloud cover - a constant. It also involved running a hose up the wall in the keeper area behind the exhibit and over the roof of the exhibit. A misting nozzle and a cup were attached to the hose to provide a more natural rain effect. The rain hose was able to attach and detach from the wall fixture easily to allow the keeper access to the ground hose for cleaning exhibits. Lastly, two sets of EcoTech Marine's Radion G4 LED light fixtures were placed above the exhibit in zone 1. These lights connected to the EcoSmart Live application and were able to simulate lightning. The app also played



Figure 1. Zone 1 includes the hose and light fixtures above the roof of the exhibit. The skylight is also covered to decrease the natural light coming through. Manny.



Figure 2. Zone 2 includes the "safe zone," with heat lamps above the roof and no changes in the weather. Manny on top of Cayenne.







Figure 3. The calendars followed throughout the study - include the forage and weather dates.

thunder sounds that synced to the lightning flashes. To allow the sounds to be heard on thunder and lightning and full storm days, I connected a cell phone to a bluetooth speaker that was placed behind the exhibit at a volume that could be heard within the exhibit.

Beginning 3 October 2018, the keeper would enter every day between 0950-1010 hrs., following the randomized forage calendar (figure 3) posted on the door to Exhibit 31. The acclimation period lasted four days before the study began, allowing the keeper's entrance and randomized forage to become normal and minimize the effect on the tamanduas' behavior. If it was a forage day, the calendar showed a check mark and the keeper would scatter worms (meal and/or wax) throughout the exhibit. If it was not a forage day, the calendar showed an X mark and the keeper would enter, stand or move around for a few moments, and then exit without throwing worms.

Observations took place Sundays, Mondays, and Tuesdays during the 11 week study. Baseline observations occurred for two weeks starting on 7 October 2018. The observations involved using the ethogram (table 1) to mark the behavior being performed by both Manny and Cayenne every minute for one hour each day, beginning when the keeper entered. During the baseline, no stereotypies were observed by Manny. Cayenne had one stereotypy that involved pacing a small circle in the upper righthand corner of the exhibit, over a branch and back across the ceiling. Following the two weeks of baseline, there were nine weeks of weather simulations. The calendars also noted what type of simulation would occur each day. While the order was randomized weekly, all three simulations occurred each week.

However, due to unforeseen events two weather simulations did not occur. The results included eight observation sessions for both rain and full storm days and nine sessions for thunder and lightning days, compared to six sessions of baseline.

#### Rain:

When the calendar indicated it was a rain day, the keeper and I would enter behind the exhibit. I would detach the ground hose and attach the rain hose while the keeper entered (scattering forage or not, according to the calendar). I would step out of the back area and begin observations before the keeper exited. When the keeper exited, he or she would turn the hose on just enough for the water to be falling steadily. The keeper would then exit the back area. Weather simulations would occur for the first 30 minutes of observations. After 30 minutes, I would shut the water off and continue with observations. Once an hour had passed, I would detach the rain hose and reattach the ground hose.

#### Thunder and Lightning:

When the calendar indicated it was a thunder and lightning day, the keeper and I would enter behind the exhibit. I would place a speaker in position on the glove shelf next to the door while the keeper entered (scattering forage or not, according to the calendar). I would step out of the back area and begin observations before the keeper exited. After the keeper exited, I would then open the EcoSmart Live application on the cell phone and begin the "thunderstorm" setting. The simulation would occur for the first 30 minutes of observations. After 30 minutes, I would turn off the thunderstorm setting and continue with observations. Once an hour had passed, I would retrieve the speaker.

#### Full Storm:

When the calendar indicated it was a full storm day, the rain and thunder and lightning conditions would occur simultaneously. The simulation would occur for the first 30 minutes of





observations. After 30 minutes, I would end the weather simulation and continue with observations for the rest of the hour.

The study was completed on 18 December 2018. In the data analysis, I looked at Manny and Cayenne's behaviors separately. I compared their behavior during the baseline to that of each type of weather simulation individually. I also analyzed their behavior during the baseline with and without forage, as well as during all weather combined with forage to all weather combined without forage. I then compared the baseline with and without forage to the weather with and without forage. I focused on the amount of time spent sedentary (behaviors: rest, alert), foraging (behaviors: foraging arboreal, foraging terrestrial, foraging rocks), and stereotypic (Cayenne's pacing).

## Results

Compared to the baseline, Manny was less active during the rain, thunder and lightning, and full storm simulations, spending more time sedentary and less time foraging (figures 5-7). Cayenne was more active during each weather simulation, spending less time sedentary and more time foraging (figures 5-7). However, her stereotypic behavior increased during the rain and full storm simulations. Manny was more active when there was forage given during both the baseline and weather simulations, but overall less active when there was weather even if there was forage given (figures 8-9). Cayenne was unaffected by the presence of forage during the baseline. She was more active during the weather with forage than the weather without, but overall more active with the weather, regardless of forage, than during both the baseline with and without forage (figures 8-9).

## Discussion

The objective of this study was to determine if weather simulations would stimulate natural behaviors in zoo-housed tamanduas, Manny and Cayenne, and cause them to be more visible and engaging for the public at a time of day they previously were not. The weather simulations did change both Manny and Cayenne's behaviors. However, Manny became less active and Cayenne became more active during the study. This could be related to their very

Rest (R) Dark blue	Prolonged motionless state in which the animal is in a specific spot in the exhibit, distinguished by minimal or null head and limb movement, eyes closed.	Sit, lay, sunbathe
Alert (A) Dark pink	Brief state in which the animal is motionless, interrupting any activity it was engaging in, eyes open, head points in the direction of a noise source (if there was any).	Stand
Locomotor (L) Dark green	Sequence of events in which the animal uses full body locomotion, moving from one point to another of the exhibit, horizontally or vertically.	Walk, climb, run, turn
Foraging, Arboreal (FA) Red	Sequence of events in which the animal explores the exhibit in search of food, distinguished by use of anterior limbs and snout in presence of a substrate or object.	Above ground (trees) - investigate, smell, swipe, puncture, move, dig
Foraging, Terrestrial (FT) Orange	Sequence of events in which the animal explores the exhibit in search of food, distinguished by use of anterior limbs and snout in presence of a substrate or object.	On ground - investigate, smell, swipe, puncture, move, dig
Forage Rocks (FR) Bright purple	Sequence of events in which the animal explores the exhibit in search of food, distinguished by use of anterior limbs and snout in presence of a substrate or object.	Above ground (rock wall where cavities often have forage) - investigate, smell, swipe, puncture, move, dig
Feeding (FE) Berry	Any action that culminated with the ingestion of food or water, marked by the repetitive introduction and retraction of the tongue into the nutritional source, often accompanied with salivation, anterior limbs are not involved.	Drink, eat (excluding forage worms)
Grooming (G) Light pink	Any action that involves handling of its own body; the snout, anterior or posterior limbs contact any body part.	Self smell, scratch, rub, snout clean, bathe
Excretion (E) Black	Event characterized by the elimination of feces or urine.	Defecate, urinate
Social Interaction (SI) Bright green	Sequence of events that occur between individuals; the action of one individual evokes a behavioral response in the other.	Touch, sniff, follow, lick, wrestle
Stereotypic (S) Bright yellow	Sequence of events, generally long, repeated always in the same manner, that do not show obvious functional achievements.	Pacing - Cayenne across the ceiling
Other (O) Bright blue	Other behaviors that do not fit the descriptions of the previous categories.	Most frequently not visible

Table 1. Southern *Tamandua* ethogram.

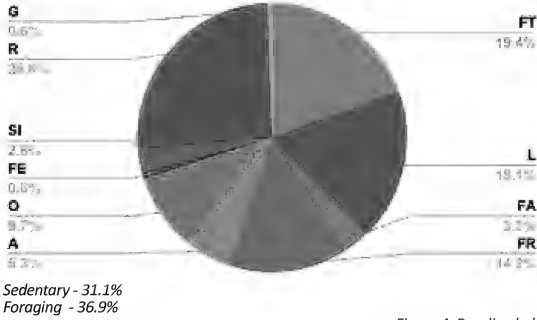
different upbringings - Manny having been in a diverse range of settings as an ambassador animal before being moved to the National Zoo's Small Mammal House, whereas Cayenne has lived the majority of her life in the Small Mammal House. This answers the first of the three research questions. Cayenne was more active in the morning with weather simulations, while Manny was not.

In regards to whether or not tamanduas are more likely to venture into the rain to forage wet soils, they were not. While Cayenne was more active during the weather simulations, she avoided the rain and would stay in zone 2. Once the weather stopped, she occasionally ventured into zone 1 to forage, but this behavior was inconsistent. Manny was very food motivated and was more active in total during forage days versus no forage days. However, even with forage, he was less active on days with weather simulations. His behaviors were also

inconsistent during the simulations versus after the simulations. On certain days he would sleep through the weather and then wake up to forage when it ended, while on other days he would be awake and foraging in the rain, eat all the worms, and then go to sleep for the rest of the hour without the weather.

It is clear that tamandua behaviors do change with precipitation, thunder and lightning, and full thunderstorm simulations. There are also many additional variables that could be analyzed with the data collected. It is clear that Manny is very food motivated. The observations also show that Cayenne's stereotypic behavior was set off by sudden changes in her environment. In the beginning of the study, I turned the speaker on behind the exhibit and it announced "connected to bluetooth" in a loud voice, which immediately disturbed her. On another day, she was set off when there were

## Baseline Total - Manny



## Baseline Total - Cayenne

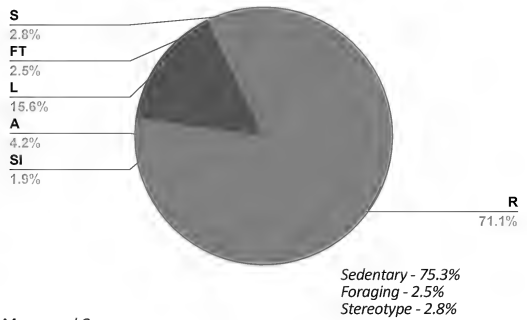
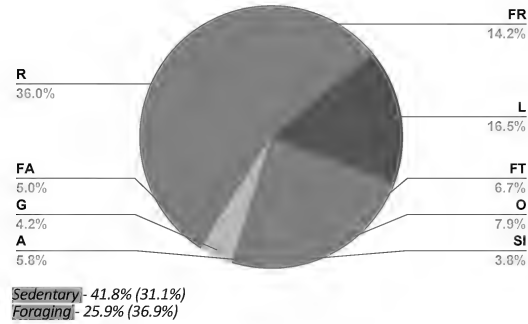


Figure 4. Baseline behaviors of Manny and Cayenne.

## Rain Total - Manny



## Rain Total - Cayenne

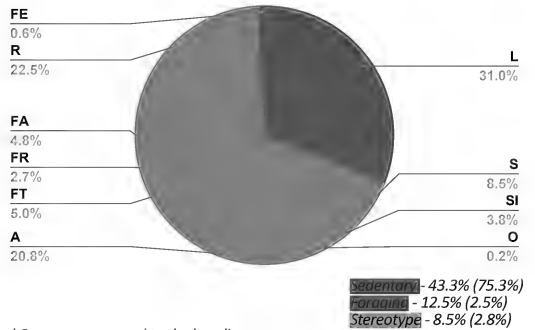
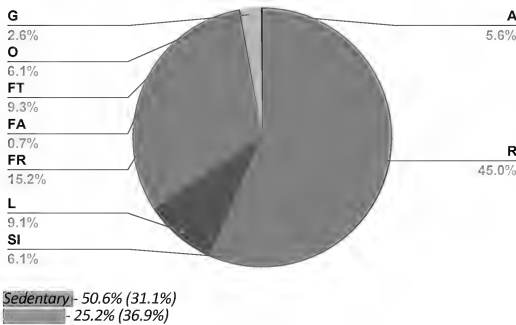


Figure 5. Rain simulation behaviors of Manny and Cayenne compared to the baseline.

## Thunder & Lightning Total - Manny



## Thunder & Lightning Total - Cayenne

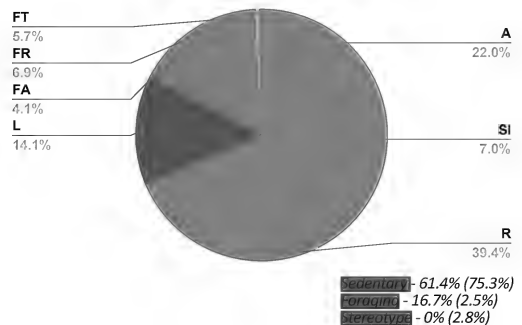
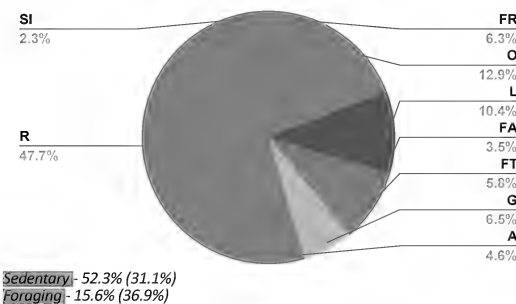


Figure 6. Thunder and lightning simulation behaviors of Manny and Cayenne compared to the baseline.

## Full Storm Total - Manny



## Full Storm Total - Cayenne

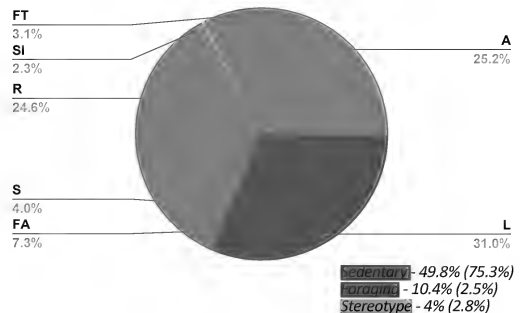
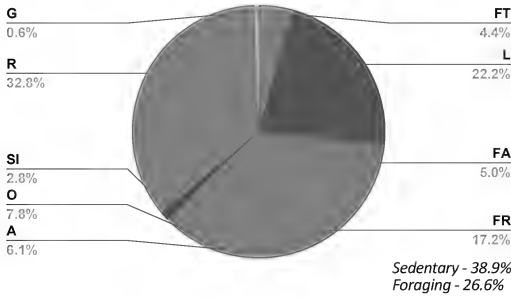
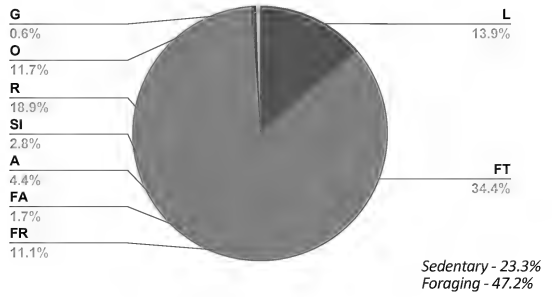


Figure 7. Full storm simulation behaviors of Manny and Cayenne compared to the baseline.

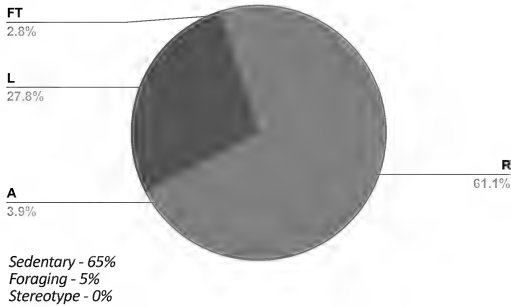
### Baseline No Forage - Manny



### Baseline Forage - Manny



### Baseline No Forage - Cayenne



### Baseline Forage - Cayenne

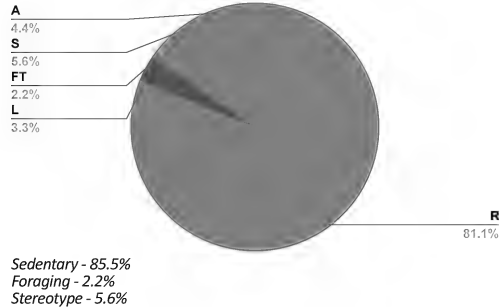
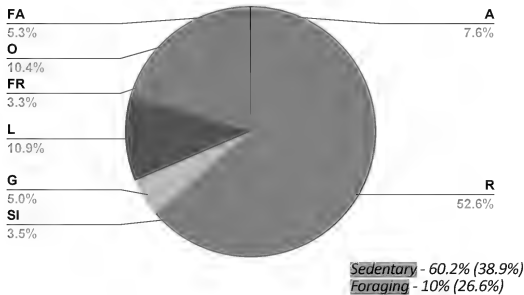
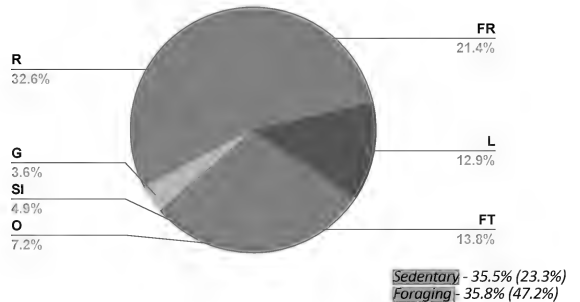


Figure 8. Baseline without forage behaviors compared to the baseline with forage behaviors.

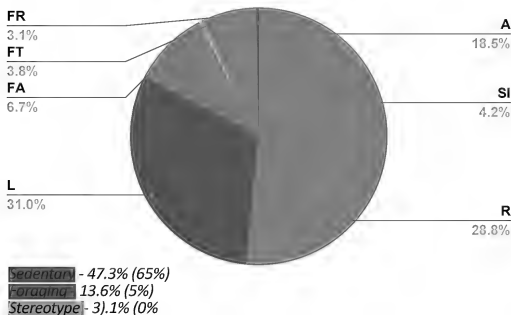
### Weather No Forage - Manny



### Weather Forage - Manny



### Weather No Forage - Cayenne



### Weather Forage - Cayenne

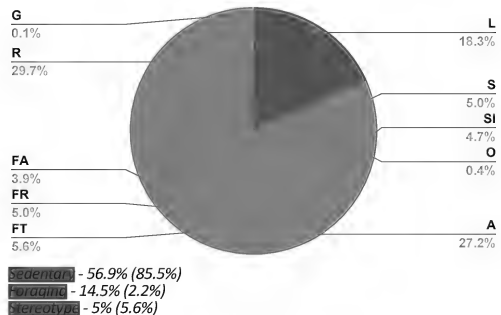


Figure 9. Weather simulations without forage behaviors compared to the weather simulations with forage behaviors.

workers speaking in the neighboring exhibit. She also reacted to the sound the hose made when sputtering to turn on. Interestingly, she did not react much to the thunder sounds that played in sync with the lightning.

The opportunity to repeat this study with a few logistical adjustments would enhance the data and results. A longer period of baseline would enable a better understanding of the tamanduas' normal behaviors, as their behaviors were somewhat inconsistent. Instead of starting immediately with the 30 minutes of weather, I would observe for 15 minutes before the weather began, introduce the weather simulation for 30 minutes, and then observe again for 15 minutes afterwards. This would be helpful to better grasp how their behaviors change each day and how the weather affects their standard behaviors. It would allow observations to include if they may have been inactive initially, then became active because of the weather or worms, or vice versa. Lastly, I would increase the controlled variables. These include specifying exact amounts of forage to be thrown in chosen locations, entering at the exact same time each day, walking a set path through the exhibit, and having marked settings for the water pressure and temperature.

#### Acknowledgements

I thank Smithsonian's National Zoo for providing young professionals like myself the opportunity to intern, conduct studies, and learn from their

staff and animals. More specifically, a big thank you goes to each member of the Small Mammal House staff for their extensive help and guidance throughout my study. Thank you to all those who helped set up the light fixtures, hose, and sheet above the exhibit. Thank you to the keepers who added to their never-ending lists and followed my enter/forage calendar every day for 11.5 weeks. And lastly, thank you so much to Ashton Ball and Kara Ingraham for being the most amazing and supportive mentors and advisors to me. 🐼

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#### Addendum

Shortly after the study was completed, it was determined that Cayenne is a male. This discovery does not affect the results of the study.

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### **Grants**

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Pittsburgh Chapter

# Dear Friends,

AAZK is once again pleased to offer our member partners a transparent view into AAZK through our 2019 Annual Report. AAZK continues to be at the forefront of animal welfare and continuing education for animal care professionals.

The *Animal Keepers' Forum* has been continually published in varying forms since 1968. Shane Good, the Editor of AKF reports on the highlights of AKF in 2019, highlighted by an issue dedicated to the 30<sup>th</sup> year of fundraising for AAZK's Bowling for Rhinos.

At the conclusion of the 2019 AAZK Conference, Paul Brandenburger was elected AAZK President. Paul reports on his goals and objectives for AAZK during his term.

AAZK awards approximately \$35,000 in member grants annually. A number of those grants concentrate on opportunities for continuing education for Professional and Affiliate members. James Winepress, AAZK Board Member Oversight for Recognition reports on the AAZK granting opportunities.

## President's Message

AAZK saw a significant influx of exciting ideas in 2019 as new leadership joined the organization. A new President and Vice President were elected and four new Board members filled vacancies. This group will strive to foster greater connectivity and communication within the animal care profession. The hard work of the AAZK Board of Directors alongside AAZK's Committees and Programs will create dynamic resources and opportunities to benefit our membership.

The position of Director of Professional Development and Conference Manager was also filled in 2019. In the ever-evolving field of animal care, high-quality professional development is essential to advance the welfare of animals and abilities of caretakers. This position will ensure that we are able to meet these challenges and maintain AAZK's high standards as we look toward the future.

**Paul Brandenburger**  
AAZK President

## Professional Development and Conference Management

In September, AAZK announced a new staff position of Director of Professional Development and Conference Management (PDCM). This staff member oversees the AAZK Professional Development Team (PDT), formerly an AAZK Committee under the Board of Directors. The Professional Development Team creates and implements the annual conference program through solicitation, selection, scheduling and moderating content. The PDT will also create professional development resources for

In 2019, Bethany Bingham was hired as the AAZK Director of Professional Development and Conference Management. Bethany will report on her efforts to promote and improve conference programming with the Professional Development Team.

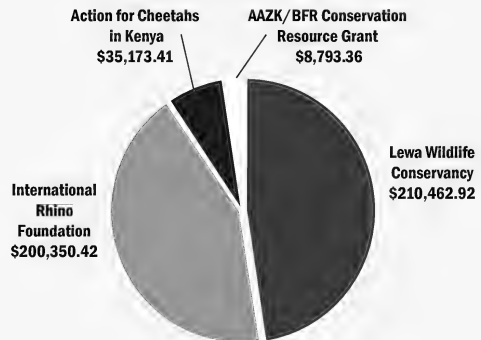
Nicole Pepo is now serving as the Vice President of AAZK with broad oversight of Committees including the two signature conservation programs of AAZK, Bowling for Rhinos and Trees for You and Me. Nicole will highlight the successes of our programs in 2019.

**Ed Hansen**  
AAZK CEO/CFO

Questions regarding the AAZK Annual Report may be directed to [Ed.Hansen@azk.org](mailto:Ed.Hansen@azk.org).

### Total BFR Funds Raised

**\$461,530.11**



members and make them available through AAZK Online as part of the AAZK strategic plan. AAZK Online is an online learning site in partnership with San Diego Zoo Global Academy, and is available to all current AAZK members.

The AAZK PDCM is also responsible for working with all future AAZK Conference Hosts to ensure that the planning process, contracts and host sites are accommodating for the conference program and delegates.

**Bethany Bingham**  
Director of Professional Development/  
Conference Management

# Thank You!

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\*Funds received after 2019 Deadline

## Animal Keepers' Forum

The *Animal Keepers' Forum* continues to be the main communication tool for members, sponsors and advertisers. The monthly journal shares quality articles submitted by our members and supporters through features such as Training Tales, Enrichment Options and Conservation Station. This year we were excited to offer our members a special dedicated issue on North American Songbirds. We also partnered with a new publisher and mail service for the AKF, allowing us to save money while getting the AKF to our members more quickly. The AKF highlights best practices and innovations in animal care, conservation success stories, plus training and enrichment ideas. Animal care professionals share and learn from experiences shared by their colleagues, and we are always interested in hearing from you. If you have comments

for the Editor or would like to submit an article or cover photo—please e-mail [Shane.Good@aaazk.org](mailto:Shane.Good@aaazk.org).

- » Shane Good, Editor
- » Elizabeth Thibodeaux, Graphic Designer
- » *Enrichment Options Column Coordinators:* Stephanie Miner, Julie Hartell-DeNardo, Beth Stark-Posta, Beth Ament-Briggs
- » *Training Tales Column Coordinators:* Kim Kezer, Jay Pratte, Angela Binney
- » *Conservation Station Column Coordinators:* Philip Fensterer
- » *Animal Welfare Column Coordinators:* Stephanie Miner, Julie Hartell-DeNardo, Beth Stark-Posta, Beth Ament-Briggs

# Conservation

Bowling for Rhinos raised an amazing \$461,530.11 in 2019 through 76 Chapter events and numerous donations. Those funds were allocated to our valued BFR partners, the Lewa Wildlife Conservancy, the International Rhino Foundation, and Action for Cheetahs in Kenya. Our CRG winner for 2019 was Dr. Susie Ellis of the International Rhino Foundation for their project "Sumatran Rhino Rescue".

Trees for You and Me raised \$14,562.69 in 2019! Kali Becher with Vital Ground was fully funded with \$5,000 for their project

that includes reforestation of previously cleared forest and in turn the reduction of CO2 in the atmosphere. Wes Swaffar with the National Forest Foundation was awarded a partial funding of \$9,562.69 for their project to revitalize former forest habitat with one tree for every \$1 awarded.

## Nicole Pepo

AAZK Vice President

# Grants

In addition to the Bowling for Rhinos Conservation Resource Grant, the Trees for You and Me Reforestation Grant and the Latin America Professional Development Grant, AAZK endowed the following individual grants:

## James Winepress

AAZK Board Member

## Professional Development:

- » Amanda Ista, Milwaukee County Zoo, EAZA International Small Carnivore Workshop, \$1250
- » Matt Neff, Smithsonian's National Zoo, Japanese Giant Salamander Fieldwork, \$750

## Professional Development, National AAZK Conference:

- » Ashley Marie Brooks, Saginaw Children's Zoo, \$1160
- » Rose Roulette, Akron Zoo, \$340

## AAZK Affiliate Member Grant, AAZK National Conference:

- » Elizabeth Fochtman, Phoenix Zoo, \$265

## EXPENSES 2019

Association Memberships (AZA)	\$ 475.00
BFR Trip Winner Payout	\$ 6,645.07
Board Travel/Lodging	\$ 8,229.87
CEO Expenses/Travel/Lodging	\$ 2,590.84
Committee	\$ 4,541.52
Conference	\$ 18,158.83
Grants	\$ 30,907.95
Office	\$ 2,233.97
Office Rent	\$ 13,166.40
Payroll Fee	\$ 2,687.65
Payroll Taxes	\$ 23,821.07
Pension Contribution	\$ 4,116.00
Pension Management Fee	\$ 1,760.00
Postage and Delivery	\$ 2,241.38
Print and Production	\$ 700.51
Product Expense	\$ 4,782.68
Program Expense	\$ 1,500.00
Salaries and Wages	\$ 64,474.71
Staff Expense	\$ 1,376.01
AKF Postage and Delivery	\$ 16,216.28
AKF Printing	\$ 65,543.68
Insurance	\$ 1,194.00
Professional Legal Fees/Tax	2,395.00
Utilities	952.94
Web Revision and Management	430.21
Total Expenses	\$ 277,207.74

## INCOME 2019

BFR Registration Fee	\$ 3,905.08
BFR Dedicated Program Income	
BFR CRG	\$ 11,159.36
BFR Trip Retention	\$ 6,750.00
Conference Income	\$ 18,223.02
Donation	\$ 23,174.63
Non-member Job Posting	\$ 3,400.00
Membership	\$ 118,162.77
Product Sales	\$ 6,278.28
Re-charter Fee & Duty Obligation	\$ 63,071.07
Advertising	\$ 31,054.74
Tax/Utility Refunds	\$ 145.63
Total Income	\$ 284,583.00

## MEMBERS

Category	December 31, 2019
Affiliate	436
Commercial	15
Conservation Partner	30
Contributing	16
Exchange	20
Institutional	161
International	28
Library	17
Lifetime	24
Professional	1,649
Student	182
Total	2,577

## AAZK BOARD OF DIRECTORS

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Sara Bjerkle  
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Kendall Emmett, Office Assistant  
Tucson, AZ

Bethany Bingham, Director of Professional Development/Conference Management  
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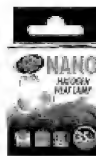
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# Hand Injecting Red Pandas in a Free Contact Situation to Decrease Distress During Veterinary Procedures

Melissa Rupani: Senior Keeper, Zoo New England

Kim Kezer: Animal Training Advisor, Zoo New England

## Introduction

Zoo New England's Franklin Park Zoo in Boston, Massachusetts has housed and exhibited red panda (*Ailurus fulgens fulgens*) since 1999. Our collection, at the time of this writing, consisted of 1.2 red pandas; our breeding pair 1.0 Hoppy, 0.1 Fia both born in 2015, and 0.1 Carys, born in 2012.

Initially, a behavioral conditioning program was established with two primary goals; to step onto a scale for monthly weights, and to enter a chute equipped with a squeeze for restraint during medical procedures. In 2012, we expanded our training program to include voluntary hand injections to facilitate medical procedures, such as administering annual vaccinations or anesthetic drugs for immobilizations. By hand injecting, we eliminate the need to restrain the animal in a squeeze, which significantly reduces stress as well as decreases the risk of injury for both animal and staff. Hand injecting anesthetic drugs is generally quicker and safer than darting or using a pole syringe. This paper is intended to share how our training program has evolved over time to improve medical procedures.

**Capture and Restraint for Immobilizations in Red Panda**  
*Overview from AZA Red Panda Care Manual; 6.6 Capture, Restraint, and Immobilization*

"Red pandas are also easily trained to enter a squeeze/transfer cage. Some short minor manipulative procedures on red pandas (e.g., vaccinations or injectable medications) can be accomplished using physical restraint by a net, heavy gloves, or a squeeze cage (Roberts & Glatston, 1994)."

Typically, the previously mentioned techniques for capture and restraint used when immobilizing a red panda come with a fair amount of stress for both the animal and the staff. Our team, both keepers and veterinary staff, decided to utilize operant conditioning in attempt to significantly reduce any stress, decrease the duration of the procedure, while increasing safety for both staff and animal before, during, and after any given procedure.



Figure 1. Original squeeze system

**Challenges with the Training Area**  
 In the original holding area, the squeeze

system we had was less than ideal (Figure 1). It was located outside, unprotected from the elements; loud when moved and difficult to operate alone. Even with regular training sessions, the pandas never fully became desensitized to being closed in the squeeze portion of their chute. The animals exhibited increasing markers of distress upon closing the door to the chute, and even more so while being squeezed. This was especially challenging with immobilization injections. The increased stress levels significantly affected the drug's ability to take effect quickly, often taking over 10 minutes.

ZNE's Dr. Alex Becket, Associate Veterinarian (at time of writing) shared his thoughts on the induction process: "Having a smooth, stress-free anesthetic event is not only important for the animal's comfort, stress-level and keeper/vet stress level. There are important physiological and health benefits to this protocol as well. If an animal is very stressed and anxious (the sympathetic nervous system, or "fight or flight" response is very active), they can sometimes override the drugs and they will not be as effective. This means we have to give higher doses and different drugs to the animal, which can compromise its safety and potentially the safety of the keepers. If, through training and desensitization, we can keep the animal relatively calm, we can generally use lower doses of injectable

drugs and it will take less inhalant anesthesia to obtain the same effect, thus decreasing the unwanted side effects. The drugs will also generally work faster as well."

Knowing this, we focused on hand injection without the use of a squeeze. Another less than ideal option was to catch the animal in a net and hand restrain, but this was also stressful and puts both the animal and keeper at risk for injury. In 2015, construction began on the new Natures Neighborhood Children's Zoo. This meant the red panda exhibit would be demolished and a new



Figure 2. Training platform.

red panda exhibit and holding would be built. During this time the pandas were off-exhibit in an area that was not equipped with a chute squeeze system. While in off-exhibit holding, a decision was made to use the already existing portable training station to shape giving hand injections with our female Carys (at the time only resident panda).

### Training Station

The training station is a freestanding platform approximately four feet tall made from 2 x 4s, plywood and bamboo. Attached to the platform is an elevated bar for the panda to place both forepaws on during training. It was originally designed to allow ultrasounds to be performed on our pandas during pregnancy. It is more often used for visual exams, body condition checks, and monthly weights. (Figure 2) We originally attempted to train the

injection in a similar manner as the ultrasound behavior; in an "up" position with both forepaws on the bar and her rear remaining on the platform. (Figure 3) Having her in the "up" position gave us abdominal access for the ultrasound. However, we needed to change the positioning for injection because her hip muscles were being over stretched, preventing the veterinary technician from properly inserting a needle into the muscle. To accommodate hand injection, Carys was trained to stand on all four feet with her head positioned in the area below the bar. (Figure 4)

### Behavioral Plans

#### Station

1. To habituate the panda to the training station, place daily diet in food bowl on platform for about a week.
2. Target panda on to platform. Give verbal cue "station" when she is walking onto the platform. Bridge and reinforce when she is on station, actively desensitizing her to the platform.
3. Continue with step 2 and gradually phase out targeting.
4. Continue establishing the verbal cue by standing at the platform and using verbal cue "station"; reinforce when panda gets onto platform.

Figure 3. Ultrasound position.



Figure 4. Injection position.

#### Hand Injection

1. While panda is at station on the platform, target panda with head positioned through opening below the top bar of platform (Injection position), working up to at least a 10 second hold.
2. As the panda is targeting, slowly move hand towards her hip. Bridge and reinforce for each approximation until you can touch her hip without her moving.
3. Once consistently allowing touch on her hip without moving, introduce touch with a capped needle to hip. Gradually increase duration of pressure with capped needle.
4. Introduce the verbal cue "sticking" just prior to touching her with capped needle.
5. Introduce second person who will give the injection. Introduce uncapped dulled needle when touching hip, building up to touching her with dulled needle for at least five seconds.
6. Once step 5 is consistent, an actual injection may be possible. Bridge and reinforce with a jackpot.
7. Following an actual injection, ask animal to move back to the injection position, bridge and reinforce. Note: If giving immobilization medication, food is not given after the injection. Reinforcement is in the form of verbal praise, or something non-edible.



Figure 5. New squeeze chute.

### Success with Hand Injections

Teaming up with zoo hospital staff, we conditioned Carys to accept a hand injection for vaccines in approximately five months. On April 6<sup>th</sup>, 2016 we were successful in administering our first voluntary vaccine injection. The response from Carys was fantastic: she moved into the injection position, then targeted and accepted reinforcement while the vet tech injected. Carys did not even flinch once! In the fall of 2016, the pandas were moved into their new enclosure, equipped with a new squeeze chute having a quieter mechanism when operated (Figure 5). Original intentions were to squeeze Carys (as this was the original method for administering anesthetic drugs), administer the anesthesia injection, then release the squeeze pressure, and wait until she was successfully sedated. Due to the training we did during construction we changed our approach for this procedure. Having had success with voluntary intramuscular injections for vaccines with similar volumes being administered, we decided to inject the immobilization medication into her on the training platform. Following the injection, she was immediately shifted into the squeeze section of the chute to provide a safe place for her to be while the anesthesia took effect. Once sedated she was removed through a door in the squeeze.

### Conclusion

Being able to hand inject our pandas in a free contact setting has been beneficial for both our animals and staff. The pandas are calmer during procedures, which enables the procedures to take less time overall. These less stressful injections allow the anesthesia medications to work faster and more completely, as opposed to an injection given under more stressful circumstances. Our free-contact training also allows our pandas to become accustomed to having a vet technician or veterinarian present during training sessions on a regular basis, creating a reinforcing relationship between our veterinary staff and the animals. While the overall process needs some fine tuning for the rest of our pandas, training this behavior has enabled our red panda training program to continue to move in an innovative and progressive direction for all involved. 🐼

### Works Cited

Glass, S., B. Henry, M. Noell, J. Reed-Smith, C. Lombardi, M. Roberts, and J. Dinon. AZA Small Carnivore TAG 2012. Red Panda Care Manual. Association of Zoos and Aquariums, Silver Spring, MD, pp. 90.

## BHC comments by Jay Pratte:

There's a lot of good stuff in here about desensitization, setting up the environment and antecedents for success, and involving the veterinary team in planning/setting/reaching goals. These are concepts we have touched on before in comments, and often a recurring theme in the Tales we publish. Two things, however, stood out to me as important concepts to think about in a training program.

The authors describe a "free contact" situation, but were originally planning to work with a chute/squeeze to aid in reaching the training goal, while reducing distress. The actual training accomplishment ended up being entirely voluntary, not even requiring a squeeze, thanks to the excellent planning and careful steps taken (I find this of particular note based on personal experience; I have actually never used a squeeze while training an animal, except as a specific location for a session or to allow improved physical access...). Often, when in free contact situations, or with tractable animals, or even when a squeeze/restraint system is built in, the importance of "choice and control" to an individual animal's welfare may be less obvious. With free contact or with animals we can physically handle, often it is easier to hold, mold into position, or do a quick "grab 'n' go" to accomplish a medical task or assessment, particularly when it is definitely quicker. Using a squeeze for non-emergent situations often becomes a fallback or crutch that shortcuts duration or voluntary compliance goals. In this Tale, our authors actually have *both* of these types of situations occurring (free contact and a squeeze), yet still proceed with a goal that permits the animal to make appropriate choices and participate voluntarily. GREAT work!

Proceeding with a training program and working towards our training goals, despite change in routine, the environment, physical location, any variable really, is deserving of recognition. Training goals and programs are often delayed or halted when significant impacts to time and resources occur. These can include staffing changes, exhibit moves, animal transfers, introduction of new conspecifics or exhibit-mates, anything really. Persevering through change and uncertain circumstances not only provides the animal(s) with a grounded sense of what is being asked of them and a note of constancy while the changes are occurring, but in this case clearly led to reaching goals (despite new chutes/squeezes in a new building) that surpassed the original exhibit/holding design ideas. Finding the time and means to adapt a program and continue to work towards training goals is an admirable accomplishment (and gave me some grounds for a comment section!).

**Thank you, as always, for sharing your efforts and submitting an excellent Training Tale to share with our community!**



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